

FleetMotus Magna Installation Guide

VERSION 3



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1 : Introduction

1:1 Attention!



Do not disassemble the device, if the device is damaged, the power supply cables are not isolated or the isolation is damaged, before unplugging the power supply, do not touch the device.



All wireless data transferring devices produce interference that may affect other devices which are located nearby.



The device must only be connected by qualified personnel.



The device must be securely fastened in the predefined location.



The programming must be performed using a second class PC (with automatic power supply).



The device is susceptible to water and humidity.



Any installation and/or handling during a lightning storm is prohibited.



FleetMotus has USB interface; Please use the cables provided with the FleetMotus device. RSG is not responsible for any harm caused by using the wrong cables.



This symbol on the packaging means that the electric and electronic equipment to be utilised must be stored separately.

1 : Introduction

1:2 Safety Instructions

This Section contains information on how to operate the FleetMotus Magna safely. By following these requirements and recommendations, you will avoid dangerous situations. You must read these instructions carefully and follow them strictly before operating the device.

To avoid mechanical damage, it is advised to transport the device in an impact-proof package. Before usage, the device should be placed so that it's LED indicators are visible, which show the status of operation the device is in.

When connecting any wiring to the vehicle, the appropriate fuses should be removed so that there is no power on the device.

Before removing the device from the vehicle the 2x20 connector must be disconnected.

The device is designed to be mounted in a zone of limited access, which is inaccessible for the vehicle operator. All related devices must meet the requirements of standard EN 60950-1.

The FleetMotus Magna is not designed as a navigational device for boats.

1:3 Legal Notice

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2 : Description

2:1 Basic Description

The FleetMotus Magna is a terminal with GPS and GSM connectivity, which is able to determine a vehicle's location co-ordinates and transfer them via the GSM network. This device is perfectly suited for applications, which need location acquirement of remote objects. It is important to mention that FleetMotus Magna has additional inputs and outputs, which allow you to control and monitor other devices on remote objects. The FleetMotus Magna also has a USB port for device status log output and entering configurations.

2:2 Package Contents

Full System Kit:

DLH-317 RSG Part Number for complete kit (one per vehicle)

Full Kit Component List (1 of each except where stated):

52-1107	FleetMotus Magna (FM5300), CAN Interface (LV-CAN200) and GPS & GPRS Antennas
24-1084	ID Card Reader
24-1091	Card reader - additional filter
17-1703	Data Logger Fitted Label
19-1457	FleetMotus Magna - Interconnecting Loom
19-1458	FleetMotus Magna - External Loom
19-1459	FleetMotus Magna - Driver ID Extension Loom
22-1410	AMP 2-794954-0 Receptacle Housing 94-2, 20-Way
22-1421	AMP 1586315-1 Contact Socket 22-18AWG
DLH-132-05	SIM Card - 'Device 2' 80MB
22-1119	Fuse Kit x 2

*Note: The Interconnecting Loom and Driver ID Loom are pre-bundled together

Extra Items as Required:

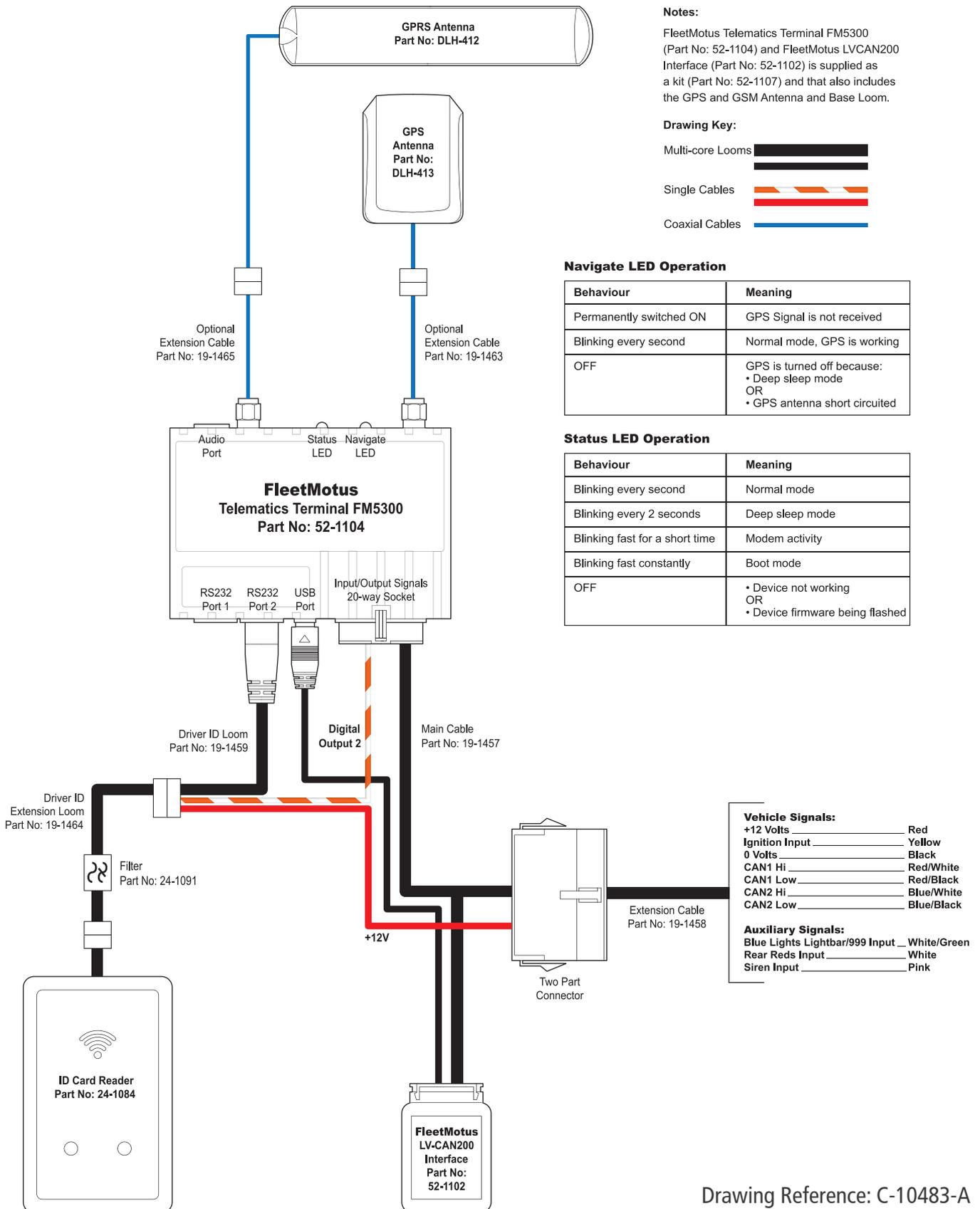
19-1463	Extension Cable - For GPS Antenna - 3 mteres
19-1465	Extension Cable - For GPRS Antenna - 3 mteres
13-1523	Card Reader Spacer
DHL-101	Siren Signal Detector

Drawing List (see pages 14-23):

C-10483-A	FleetMotus Magna - Schematic Diagram - Page 4
C-10484	FleetMotus Magna - Interconnecting Loom - Complete Wiring Diagram - Page 16
C-10467-1	FleetMotus Magna - Interconnecting Loom - Main Section Wiring Diagram - Page 17
C-10468	FleetMotus Magna - External Loom Wiring Diagram - Page 21
C-10486	FleetMotus Magna - Interconnecting Loom - Driver ID Section Wiring Diagram - Page 19
C-10487	FleetMotus Magna - Driver ID Extension Loom Wiring Diagram - Page 23
C-10466	FleetMotus Magna - Installation Record Sheet - Page 14

2 : Description

2:3 Schematic Diagram



Drawing Reference: C-10483-A

3 : Installation

3:1 Installation Process

These instructions are aimed at individuals who are undertaking the installation of the 'FleetMotus Magna' telematics device and its ancillary equipment. It should be noted that the installer is an experienced and competent Auto-Electrician.

As there are a large number of vehicle types and models, the instructions and information contained in this manual are by necessity generic in nature. It is the responsibility of the installation engineer to determine the best location for the device and the source of data inputs.

3:2 Equipment Check

Prior to commencing your installation it is advisable to ensure you have all the materials required to complete the work.

It is advisable for someone to check the contents of the FleetMotus kit against the enclosed package content (2:1) as and when they are delivered. Ancillary items such as Siren Signal Detectors, CAN-BUS interface and Driver Identification Modules may be shipped separately as they are not required for all vehicle types.

3.3 Identify the Optimum Location for Installation

For correct operation of the Telematics Device, in particular for the internal accelerometers, it is important that device is installed on a flat level surface with the cable connection facing the front of the vehicle, and the antennae connections at the rear of the device.

It has been found in practice that the best location for installing the device is underneath the front passenger seat, giving consideration to water penetration. It is also worth considering mounting the device in the luggage / spare wheel area.

Please remember to check that there is sufficient space to fix the device and its associated wiring in the location selected, also consider that it is necessary to connect a laptop to the device as part of the final setup.

Note: Before finalising the location:

- *Select a location where the Telematics Device is least likely to be damaged or cause discomfort to the vehicle users*
- *Consider cable loom routing and connection to auxiliary equipment i.e. Lightbar/999*
- *Consider access for Data Extraction and Final setup*

3 : Installation

3:4 Location Preparation

Assuming that the telematics device is to be installed under the front passenger seat, remove the seat for better access.

Caution: Follow the manufacturer's instructions for disabling airbag system.

Note: The vehicle ignition should be turned off.

Using the FleetMotus Magna as a template cut the carpet along three edges and fold back the carpet. The carpet can be folded back over the unit once installation is completed. Remove any sound proofing to ensure a solid base for fixing the device to the floor or wheel well.

Caution: Before cutting carpets and drilling any holes in the floor check that there is no cable looms beneath the carpet that could get damaged.



When you are ready to install the unit please use a suitable method of fixing to the floor pan of the vehicle. Methods to consider are: double sided sticky foam, hook and loop or any other suitable solution. Be aware that the FleetMotus device may be removed and refurbished so the fixing method must not damage the device.

3 : Installation

3:5 FleetMotus Magna and Auxiliary Equipment Details

It is important for future reference to note details of the FleetMotus and auxiliary equipment on the Configuration Sheets. Now would be a good time to do this while all serial numbers etc. are easily available.

Note: The following information should be entered on the Configuration Sheets:

- *Where the telematics device and auxiliary equipment is installed in the vehicle*
- *The Manufacturer's serial number (this is different to the RSG serial number)*
- *The RSG (white label) serial number of the device and auxiliary equipment*
- *The IMEI number of the FleetMotus*

The next stage of the process involves the identification of outputs from the vehicle for connection to the FleetMotus i.e. Blues, Siren and Rear Red etc. Note: Special attention needs to be given when determining the correct signal for Blues.

The Blues signal needs to be from a source that always has a feed whilst the lightbar is active.

Prior to connecting the vehicle outputs to the FleetMotus inputs, use a multi-meter to check that the correct signal is being detected.

Note: Record the source, location and colour of wire details on the Configuration Sheets.

Most vehicles that are having the device installed require a CAN bus connection (this can be 1 or 2 connections). Using the instructions provided by RSG, locate the CAN-Bus High/Low wires and connect the FleetMotus' CANbus interface.

The Loom for the FleetMotus can now be split and taped into required runs and length.

Remove all necessary Panels from the vehicle. Care should be taken to ease replacement.

To ensure security of fitting, all connections should be made using soldered joints. Power feeds should be made using the supplied fuse holders and fuses.



The Siren Signal Detector is connected via the two whites onto the Siren Speaker Wires the black wire connects to ground and the red wire connects to the IDR. The Siren Signal Detector fits on to the vehicle backboard.

If the vehicle is fitted with a CVS-012 or a MCS-32, it may be possible to take a Siren active signal from either of these units to supply the FleetMotus.

- *The CVS-012 has a dedicated output (output monitor 18)*
- *The MCS-32 will have to be correctly configured to provide an output*

3 : Installation

3:6 Installing the optional CANbus interface



The FleetMotus Magna device has an optional CANbus interface, when fitting this device the connector is included in the main loom and has enough length to allow for the interface to be mounted next to FleetMotus Magna device.

In the vehicle loom provided are the four CAN wires that will need to be connected to the vehicle;

CAN 1 - Red/White 'CAN Hi', Red/Black 'CAN Lo'

CAN 2 - Blue/White 'CAN Hi', Blue/Black 'CAN Lo'

The actual connection points are vehicle specific and reference should be made to the correct vehicle connection sheet obtained from RSG.

3.7 Installing the GSM and GPS antennas

Choose suitable locations for the antenna's to be mounted, the GSM antenna is best situated in the corners of the windscreen or on none opening rear quarter panel windows, if necessary the supplied cable can be extended with an extension lead.

The GPS antenna should be mounted in such a way that it has a clear view of the sky. It should also be mounted horizontal i.e. on the dash or on a ledge in the rear of the car.

3.8 Installing the FleetMotus Magna Unit

The unit can now be fitted in the chosen location, please be aware that the harness connection must point forward and that the antenna connections are at the rear of the device. Please also remember that the device needs to be mounted as flat as possible.



FleetMotus Magna installed into a Vauxhall Corsa

3 : Installation

3:9 Installing the Driver ID Unit

To enable easy access for presenting the Driver ID card over the Driver ID reader, the reader should be installed in a convenient location, as not to cause discomfort or an obstruction to vehicular controls. The lead from the Driver ID card reader should be connected to the extension lead provided which must then be connected to the FleetMotus Device loom.



Suggested card reader location dependent upon vehicle make and model

Note: Please make sure that the additional filter/regulator (Part No. 24-1091) is installed by the card reader (failure to do so will invalidate the warranty of the card reader).

The filter should be fitted between the card reader and the end of the Driver ID Extension Loom. If not installed during installation the card reader warranty will be void.



4 : Final Connections

The FleetMotus Magna device requires an un-interrupted +12v supply, an ignition supply and a ground, these connections are made in the vehicle loom provided.

Logged inputs, the FleetMotus Magna has the ability to log predetermined inputs, for hazard warning equipment, these should be wired, using the main vehicle loom, as below.

Siren - Pink Wire

Blues (Lightbar/999) - White/Green wire

Rear Reds - White Wire

Mini USB lead, in the FleetMotus Magna loom there is a mini USB lead, this needs to be connected to the Mini USB connector at the front of the FleetMotus Magna device.

RJ45 Connector, this connector if using the Driver Id interface, will need to be connected to PORT 2 of the FleetMotus Magna.



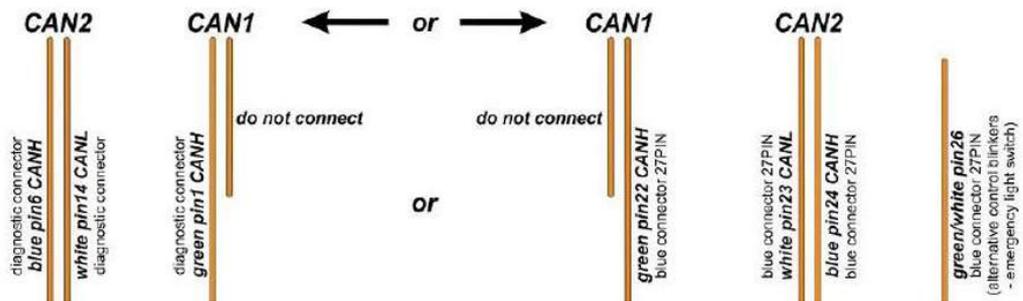
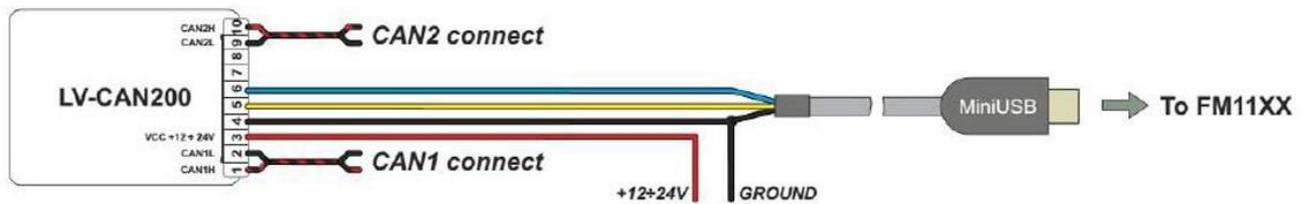
5 : CANbus Interface

5:1 Programming the CANbus Interface

The CANbus interface now has to be programmed to the vehicle it is fitted to. Please refer to the same sheet used to identify the connection points for the CANbus wiring.

Mfr.: OPEL	Model: CORSA E	Year: 14 →	rev.00
Device LV-CAN200 PROGRAM NO.: 243 2013-09-13			

WIRE CONNECTING ORDER: Connect to FM11XX, GROUND, +12V, SET THE PROGRAM NUMBER FOR THE GIVEN VEHICLE, CONNECT CAN-L AND CAN-H.



Underneath the Vehicle manufacturer box and next to the device / model number is a program number, in the example above this is **PROGRAM NO.: 243**, please note this.

NOW TURN THE IGNITION ON

You should notice the LED indicator light up with power applied.



5:2 To Select the Program

- Press and hold the switch down until the LED starts Blinking
- Release the switch
- The LED will start blinking and counting the first digit of the program number, (one blink means digit 1, two blinks mean digit 2 and so on)
- To stop the counter and select the digit required, briefly push the switch down
- Release the switch, the LED starts blinking and counting the second digit of the required program number
- To stop the counter and select the digit required, briefly push the switch down
- Release the switch, the LED starts blinking and counting the Third digit of the required program number
- To stop the counter and select the digit required, briefly push the switch down
- If the program selection is successful, the led will blink 10 times

5 : CANbus Interface

5.3 Setting the FleetMotus Magna Parameters and enabling CAN data

Please ensure the Mini USB from the CANbus interface is connected to the FleetMotus Magna.

NOW START THE ENGINE, allow to idle for a short while and operate the Hazard Warning Equipment being monitored.

Remove the CANbus interface USB lead and connect the computer to the Fleet Motus Magna, with the lead supplied and run FM5XXX configurator.

STEP 5.3 MAY NOT BE NECESSARY IF UNIT IS PRE-CONFIGURED - CHECK WITH SUPERVISOR!

1. Check **COM PORT** is set
2. Click Connect Button
3. COM PORT will change to a different COM PORT
4. Click **LOAD**, this loads the configuration and APN information will be visible
5. Make a note of the **IMIE** number that appears at the top of the page, fill in the vehicle record sheet
6. Click **ADVANCED CONFIGURATION**
7. Click on **LVCAN**, the page will change layout (default is profile 3)
8. Click on **SCAN**
9. Click on **PROFILE 1** tab, this will load parameters
10. In the **SEND DATA TO SERVER** column, make sure all are low priority enabled
11. In the **DATA ACQUISITION TYPE** column, make sure all are set to **MONITOR**
12. Click on **PROFILE 2** tab, this will load a new table
13. Repeat steps 9 and 10 for profile 2
14. Click **SAVE**, progress will be shown in the bottom left of window
15. In the bottom left when the progress says verified click **DISCONNECT**

Now disconnect the Mini USB lead from the FleetMotus Magna, and reconnect the one from in the loom, from the CANbus interface.

5:4 Verify Settings and Connection to Server

At this point fill in the mileage at install point on the FleetMotus Magna - Installation Record Sheet (C-10466) along with the rest of the relevant vehicle details, and also complete the vehicle map by marking the key components down on the drawing.

Prepare the vehicle for data checking, take the vehicle outside, leave the vehicle ignition on for 5 minutes.

- Start the vehicle and use a 'driver identification card' to silence the buzzer.
- Let the vehicle idle for 30 seconds, now begin the 'test routine'.
- Drive the vehicle around outside for a short distance and park it at the predetermined 'test location'
- Activate the Blue Lights for 10 seconds and turn off. No further equipment use for 10 seconds.
- Activate the Rear Reds for 10 seconds and turn off. No further equipment use for 10 seconds.
- Activate the Siren For 5 Seconds.
- Return the vehicle to the workshops.
- Cycle the ignition twice.

Now take the completed installation record sheet to the designated administrator for them to check the vehicle has:

1. Logged onto the system
2. The mileage is correct
3. The driver identification card number has been seen
4. The monitored Hazard warning equipment has been seen in the correct order

At this point if the information is received correctly, the nominated Fleet Telematics administrator will need to sign the Vehicle off using the 'system set-up & test verification' box. A copy of the sheet needs to be left with them and a copy kept for RSG records.

The vehicle can now be put back together and returned to service.

6 : De-commissioning the FleetMotus Device

Before removing a FleetMotus device from a vehicle, to be decommissioned, it is necessary to check with the system administrator that the last journey of the vehicle has been received, if the vehicle is damaged it may be necessary to restore power to the FleetMotus device until it has successfully transmitted all of the journey data for that vehicle.

It is recommended that when a vehicle is decommissioned the fuses for the FleetMotus is removed to make safe the electrics. The FleetMotus can then be removed from the vehicle, complete with the interconnecting loom, the driver ID card reader and if appropriate the driver feedback device.

Because it is not cost effective or practical to remove the GPRS and GPS antennae it is suggested that these be left in the vehicle, along with the vehicle loom.

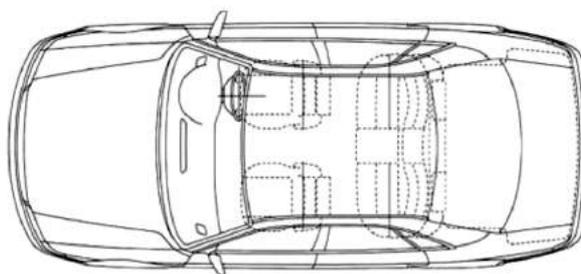
When wanting to re-fit a used system it is advised that new GPRS and GSM antennae, along with a vehicle loom are sourced from RSG.

Once the system is re-installed in a new vehicle the commissioning procedure is the same as if it were a new unit....**PLEASE REFER TO SECTIONS 1-5.**

FleetMotus Magna - Installation Record Sheet

Vehicle Details			
Vehicle Registration:			Fleet Number:
Make:			Model:
Date and Time Install Completed:	Date	Time	Mileage at Install Point:
Customer Job Number/Reference:			RSG Job Number/Reference:

Please mark the location of the FleetMotus Magna and the Antenna's (GPS & GPRS)



FleetMotus Telematics Device Details			
Device	Device Serial Number	RSG Part Number	RSG Serial Number
FleetMotus:			
CAN Module:			
Driver ID Unit:			
SIM Card Phone Number:			
Device IMEI Number:			

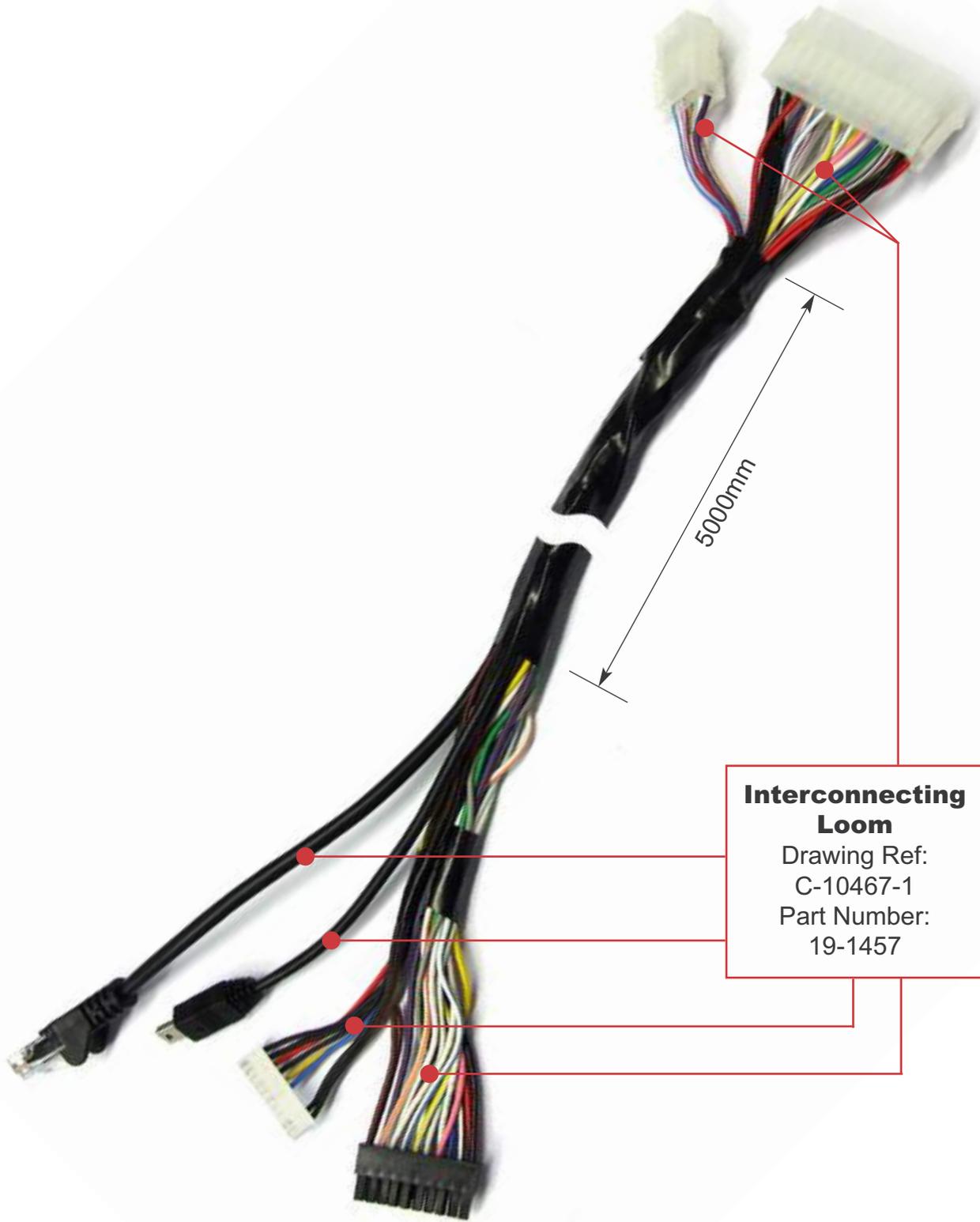
CAN Connections and Location			
Program Number Ref:			
Function	From	To	Wire Colour
Vehicle CAN 1	CAN Module		
Vehicle CAN 2			
DIN 1 : Ignition			
DIN 2 : Blue Lights			
DIN 3 : Rear Reds			
DIN 4 : Siren			

Signatures				
Device	Name	Signature	Company	Date
System Set-up & Test Verification				
Customer Approval				

Appendix A Drawing Reference: C-10466

FleetMotus Magna - Main Loom inc. Driver ID Loom

Appendix B1 Drawing Reference: C-10484

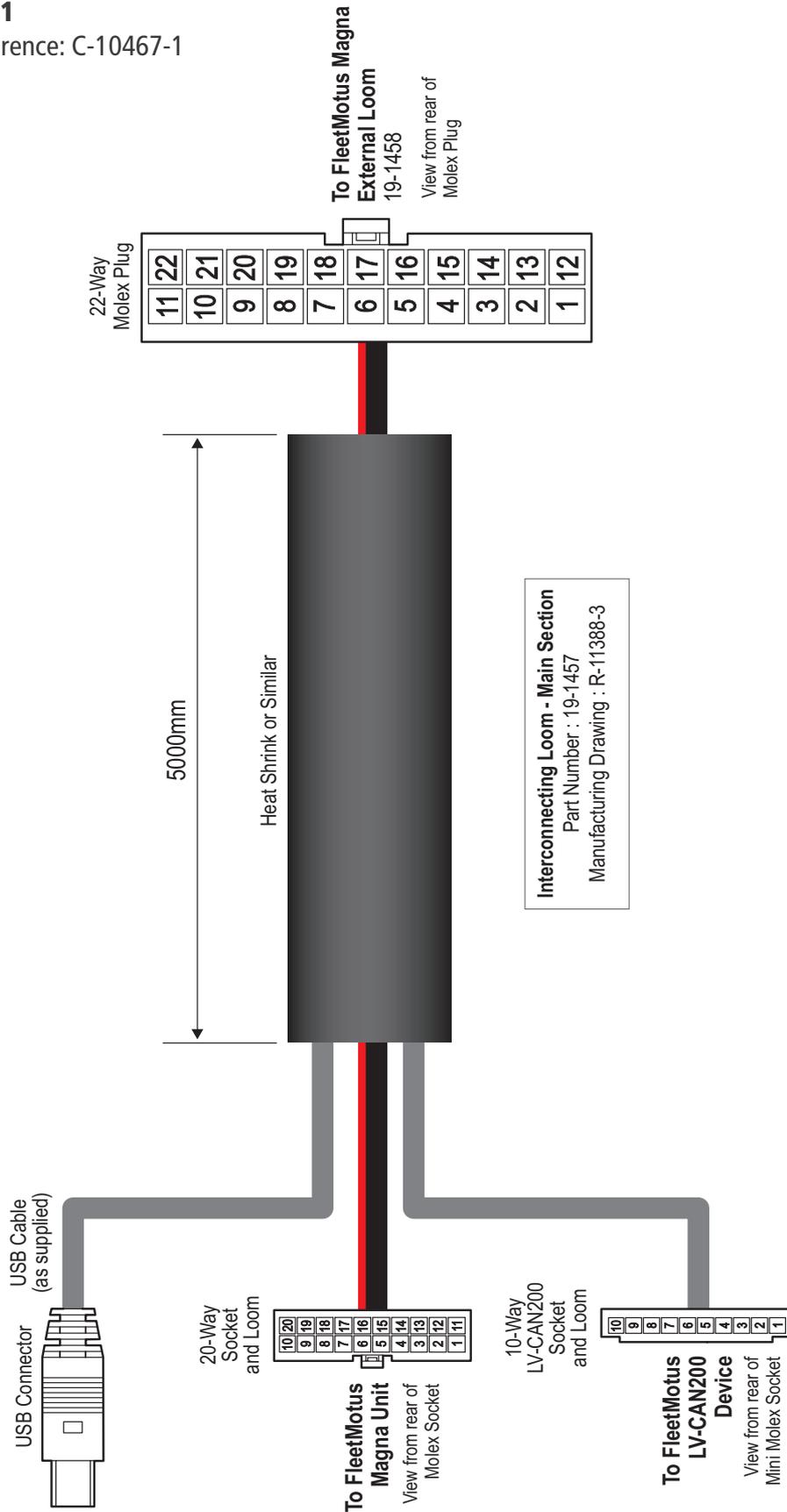


Interconnecting Loom
Drawing Ref: C-10467-1
Part Number: 19-1457

FleetMotus Magna - Interconnecting Loom

Appendix C1

Drawing Reference: C-10467-1



FleetMotus Magna Interconnecting Loom - Main Section Drawing Reference: C-10467-1

FleetMotus Magna - Interconnection Chart

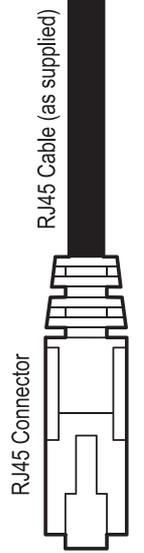
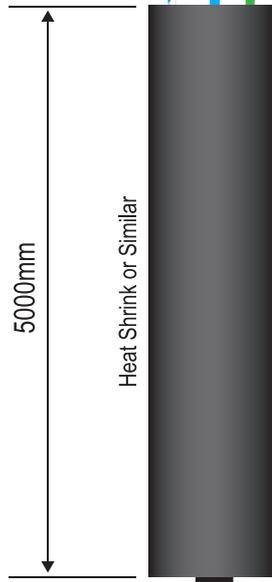
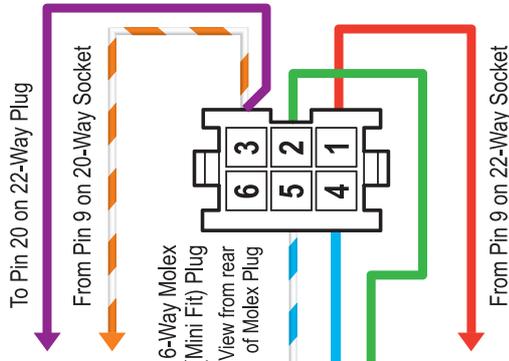
Appendix C2 Drawing Reference: C-10467-1

Interconnecting Loom 22-Way Plug		Signal Function	FleetMotus Magna 20-Way Socket	FleetMotus Magna LV-CAN200 Socket	
Pin	Wire Colour	Description	Pin	Pin	Wire Colour
1	Black	GND 0 Volts	1	4	Black
2	White/Black	CAN L (FMS)	2		
3	Blue	1 Wire PWR	3		
4	Pink	Digital Input 4 (Siren)	4		
5	White/Green	Digital Input 2 (Blues - Lightbar/999)	5		
6	White/Yellow	Analog Input 4	6		
7	White/Blue	Analog Input 2	7		
8	White/Brown	Digital Output	8		
	N/A	Digital Output 2 to Pin 3 on 6-Way Molex	9		
	Driver ID	Power to Pin 1 on 6-Way Molex			
10	Red/Black	CAN 1 Low	10 Link with Pin 20	2	Brown or *Black/Red - Pair A
11	Blue/Black	CAN 2 Low		9	Green or *Black - Pair B
12	Red	+Vcc 10 to 30 Volts DC	11	3	Red
13	White/Red	CAN H (FMS)			
14	Green	1 Wire Data	13		
15	White	Digital Input 3 (Rear Reds)	14		
16	Yellow	Digital Input 1 (Reversed for Ignition)	15		
17	White/Grey	Analog Input 3	16		
18	Grey	Analog Input 1	17		
19	White/Purple	Digital Output 4 to Pin 3 on 6-way Molex	18		
20	Purple	Digital Output 1 - Loop to 10	19		
21	Red/White	CAN 1 High	20 Link with Pin 10	1	Brown/White or *Black/Red - Pair A
22	Blue/White	CAN 2 High		10	Green/White or *Black - Pair B
				5	Data Yellow to USB
				6	Data Blue to USB

*Early loom wire colours

FleetMotus Magna - Driver ID Loom

Appendix D Drawing Reference: C-10486



Driver ID Loom - Section
 Part Number : 19-1457
 Manufacturing Drawing : R-11388-3

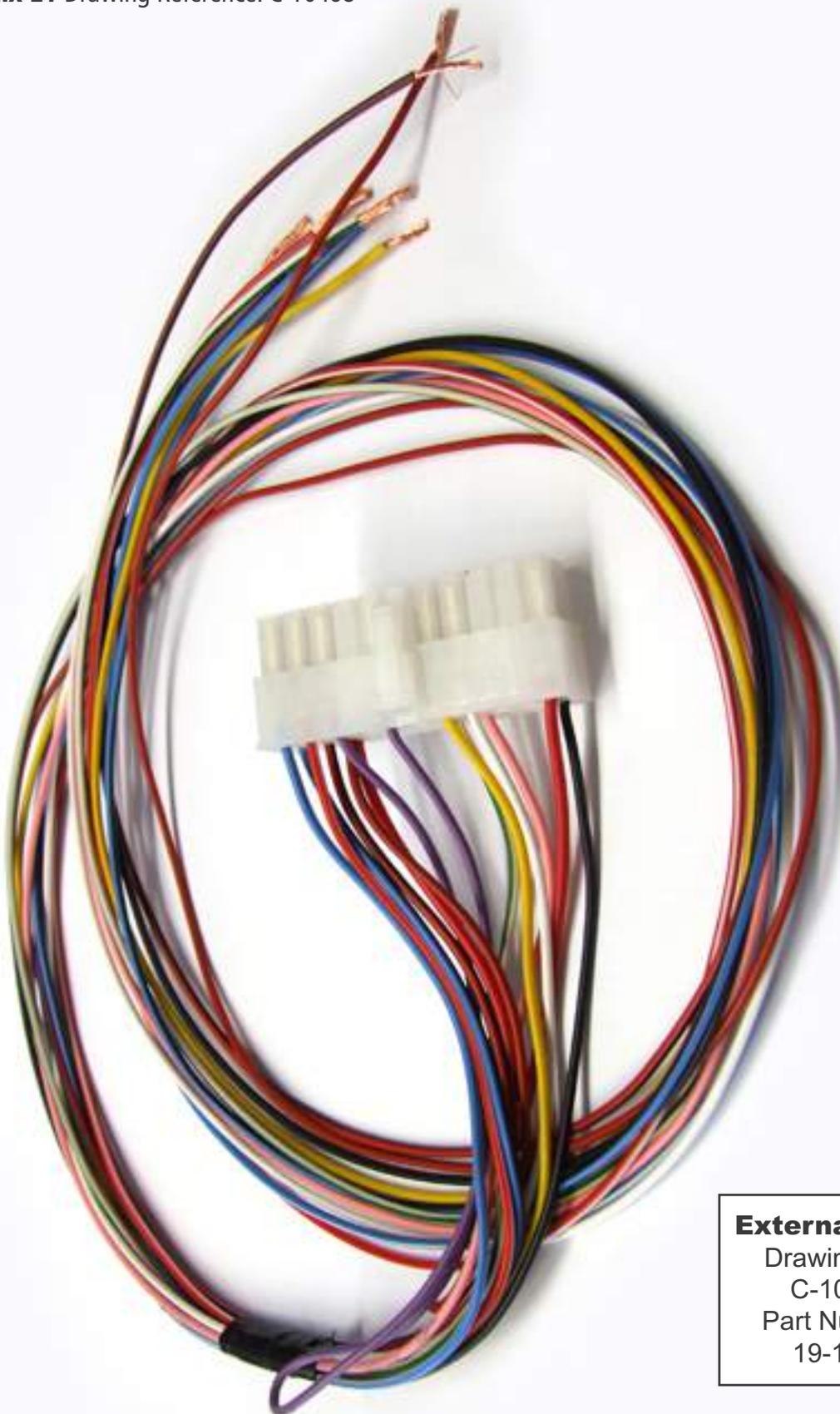
Pin	Wire Colour	Function
1	Red	12 volts - from Pin 9 on 22-Way Connector
2	Green	Rx - from RJ45
3	White/Orange	Digital Output 2 - from Pin 9 on 20-Way Connector
	Purple	To Pin 20 on 22-Way Plug
4	Blue	0 volt - from RJ45
5	White/Blue	Tx - from RJ45
6	Blank	Not used

Please note: This loom will be bundled with the main FleetMotus loom

FleetMotus Magna Interconnecting Loom - Driver ID Section Wiring Diagram Drawing Reference: C-10486

FleetMotus Magna - External Loom

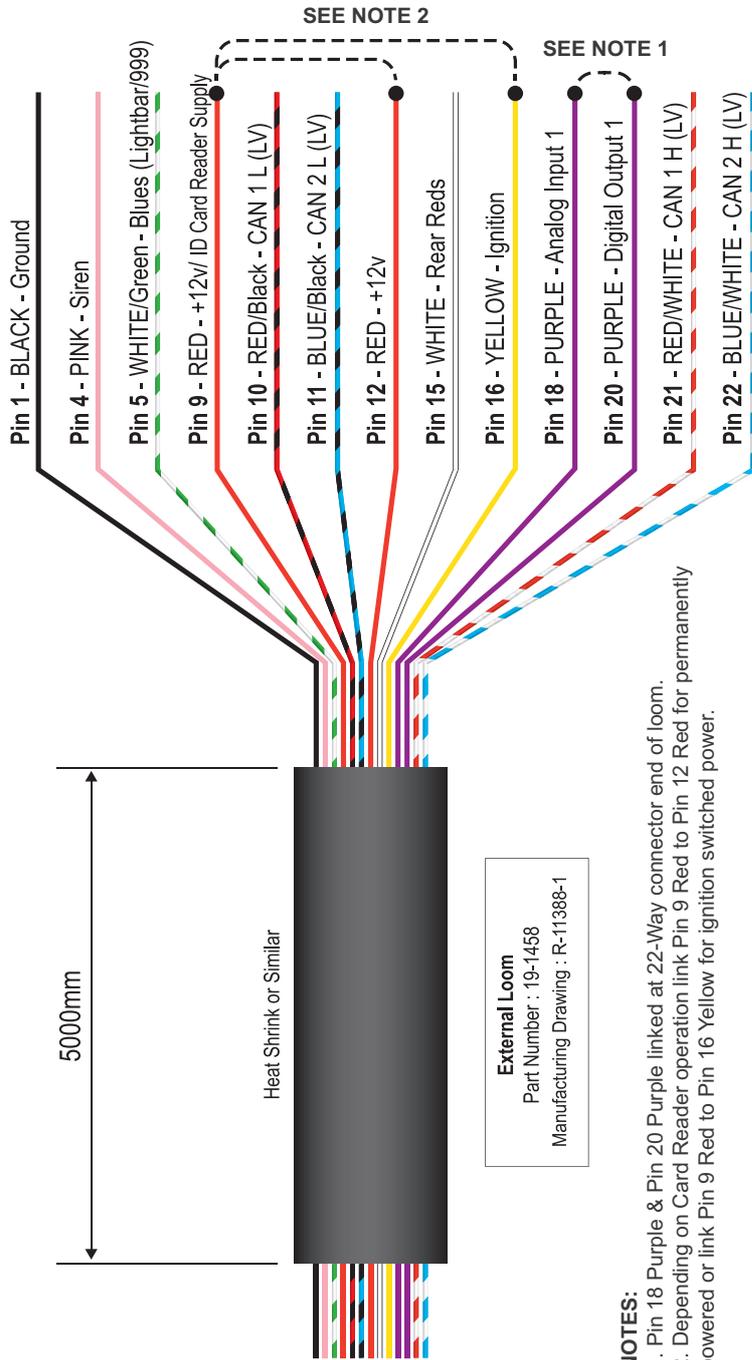
Appendix E1 Drawing Reference: C-10468

**External Loom**

Drawing Ref:
C-10468
Part Number:
19-1458

FleetMotus Magna - External Loom

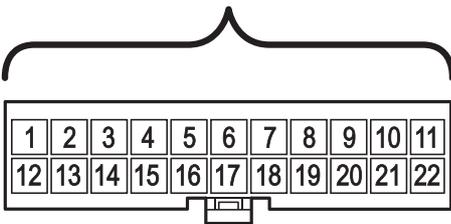
Appendix E2 Drawing Reference: C-10468



External Loom
Part Number : 19-1458
Manufacturing Drawing : R-11388-1

NOTES:

1. Pin 18 Purple & Pin 20 Purple linked at 22-Way connector end of loom.
2. Depending on Card Reader operation link Pin 9 Red to Pin 12 Red for permanently powered or link Pin 9 Red to Pin 16 Yellow for ignition switched power.



To FleetMotus Magna Interconnecting Loom

Pin	Wire Colour	Function	Pin	Wire Colour	Function
1	Black	Ground	12	Red	
2	Blank	Blank	13	Blank	Blank
3	Blank	Blank	14	Blank	Blank
4	Pink	Digital Input 4	15	White	Digital Input 3
5	White/Green	Digital input 2	16	Yellow	Ignition (Digital Input 1) Loop to 9
6	Blank	Blank	17	Blank	Blank
7	Blank	Blank	18	Purple	Analog Input 1 - Loop to 20
8	Blank	Blank	19	Blank	Blank
9	Red	Loop to 16	20	Purple	Digital Output 1 - Loop to 18
10	Red/Black	CAN 1 L (LV)	21	Red/White	CAN 1 H (LV)
11	Blue/Black	CAN 2 L (LV)	22	Blue/White	CAN 2 H (LV)

View from rear of Molex Socket

Drawing Reference: C-10468

FleetMotus Magna - External Loom Wiring Diagram

FleetMotus Magna - Driver ID Extension Loom

Appendix F1 Drawing Reference: C-10487

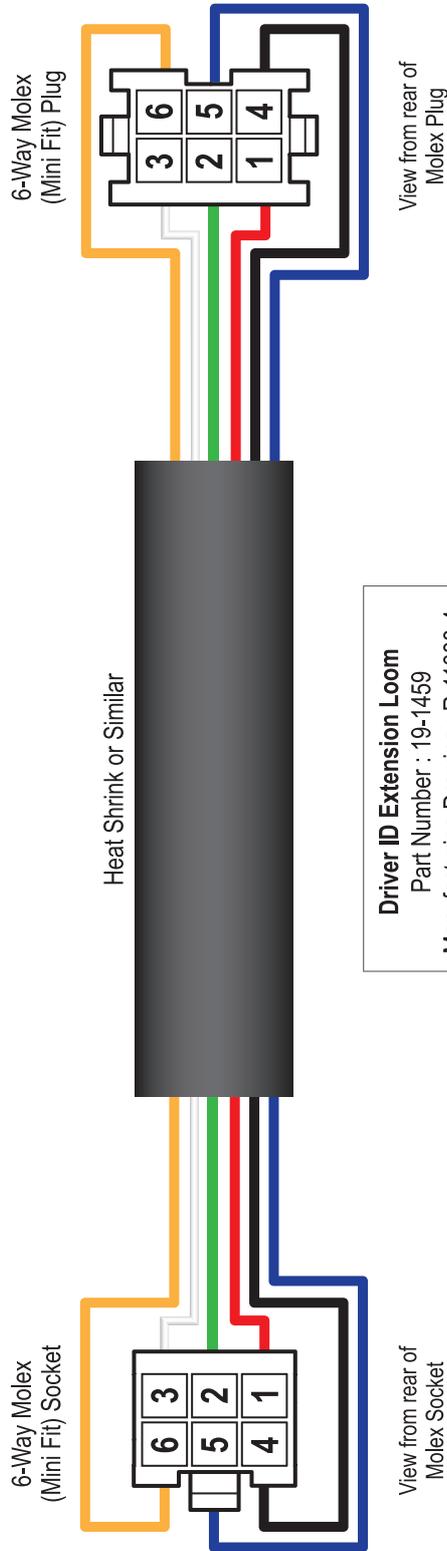


**Driver ID
Extension Loom**

Drawing Ref:
C-10487
Part Number:
19-1459

FleetMotus Magna - Driver ID Extension Loom

Appendix F2 Drawing Reference: C-10487



Pin	Wire Colour	Function
1	Red	12 volts - from Pin 9 on 22-Way Connector
2	Green	Rx - from RJ45
3	White	Digital Output 2 - from Pin 9 on 20-Way Connector
4	Black	0 volt - from RJ45
5	Blue	Tx - from RJ45
6	Yellow	Not used

Please note: This loom will be bundled with the main FleetMotus loom

FleetMotus Magna - Driver ID Extension Loom Wiring Diagram

Drawing Reference: C-10487